DOCUMENT RESUME

ED 304 964 HE 022 252

AUTHOR Kalsbeek, David H.
TITLE Linking Learning Style Theory with Retention Research: The TRAILS Project. AIR Professional File.
INSTITUTION Association for Institutional Research.
PUB DATE 89
NOTE 9p.
AVAILABLE FROM Association for Institutional Research, 314 Stone Building, Florida State University, Tallahassee, FL 23206-3038.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Persistence; *Cognitive Style; *College Attendance; College Students; Enrollment Influences; Higher Education; *Personality Traits; Student Attrition; Student Characteristics
IDENTIFIERS *Myers Briggs Type Indicator; *TRAILS Project MO

ABSTRACT

The Trucking Retention and Academic Integration by Learning Style (TRAILS) research project at St. Louis University, which is designed to incorporate information on learning style in ongoing enrollment research and improve campus retention, is described. Learning style and the Tinto Model of student attrition are discussed, along with the personality theory of Carl Jung which serves as the conceptual foundation for the Myers-Briggs Type Indicator (MBTI) personality assessment. The TRAILS project positions educators to use the MBTI both in institutional studies and in campus programs. Most undergraduate students complete the MBTI as part of the housing application process or the freshman orientation program. Preliminary TRAILS data are presented pertaining to using the MBTI to describe academic populations, the relationship of the MBTI and measures of academic aptitude, the relationship of the MBTI and academic achievement, and using the MBTI to understand persistence patterns. It is suggested that certain personality characteristics affect student performance in many ways. The project attempts to meld these pieces in a comprehensive enrollment research scheme. Preliminary data suggest there are no differences between types of learners in upper-class academic achievement in the heart of their chosen curriculum. Also, if certain types of learners tend to score lower on aptitude tests then others, the trend of declining board scores takes on new meaning. Tables are included. Contains 15 references. (SM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

The Association for Institutional Research
Number 32 Winter 1989

ED304964

AIR
for Management Research, Policy Analysis, and Planning

AIR Professional File

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Association for Institutional Research
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
U.S. DEPARTMENT OF EDUCATION

Linking Learning Style Theory with Retention Research: The TRAILS Project

David H. Kalsbeek
Assistant Vice President, Student Development
Saint Louis University

This paper presents an overview of an institutional research project at Saint Louis University which is designed to incorporate information on learning style in ongoing enrollment research. The influence of a student's learning style on his or her college experience may be so pervasive that such data significantly enlighten nearly every facet of the research agenda. The findings begin to call into question many established institutional practices which may, in fact, work to the disadvantage of certain types of learners. More importantly, linking learning style theory with retention research produces knowledge that can readily be used in numerous retention interventions.

Learning Style and the Tinto Model

One conceptual model of student attrition has been developed by Tinto (1975), and his particular model has been widely cited and tested (Bean, 1982). Tinto suggests that the critical factor in retention is the degree of congruence between the needs, interests, abilities, expectations, and commitments of the students, on the one hand, and the academic and social systems of the specific college or university on the other. Every student inevitably experiences some degree of integration or "fit" with the institutional environment, both academically and socially. Tinto's model suggests that it is this degree of integration experienced by each individual student which is manifested in the student's enrollment choices. When one views dropout as an outcome of such a process, then the appropriate focus of retention research is the nature of the interaction of the individual student with the campus environment.

If, as Tinto suggests, the key factor in retention is the integration experienced by individual students with the unique academic and social dimensions of the campus climate, then it is important to understand the cognitive and affective processes students use in negotiating the academic and social environments of the university or college. One framework for understanding these processes is provided by the personality theory of Carl Jung (1923) which serves as the conceptual foundation for the Myers-Briggs Type Indicator (MBTI) (Myers & McCaulley, 1985), a widely used personality assessment instrument. The theory underlying the MBTI suggests "that much seemingly random variation in behavior is actually quite orderly and consistent, being due to basic differences in the way individuals prefer to use their perceptions and judgment" (Myers & McCaulley, 1985, p. 1). The MBTI contains four separate scales or indices which reflect a person's basic preferences regarding how they become aware or gather information (perception) and how they draw conclusions or make decisions about what is perceived (judgment). These four indices are outlined in Table 1.

The four indices or dimensions of the MBTI have been related to numerous other psychological and academic measures which suggest that the MBTI is an effective measure of a student's learning style (Myers & McCaulley, 1985; Lawrence, 1984). Learning style can be understood as a person's preferred approach to information processing, idea formation, and decision making; the attitudes and interests that influence what is attended to in a learning situation; and a disposition to seek learning environments compatible with these

HE 022 232

BEST COPY AVAILABLE

Table 1

The Four Preference Indices of the Myers-Briggs Type Indicator

	Scale	Dimensions	Description of Preference
Preferred orientation to inner/outer world	EI	Extraversion (E)	A person's preferred orientation is toward the outer world of people, events, activities, things.
		Introversion (I)	A person's preferred orientation is toward the inner world of ideas and concepts.
Preferred mode of perception	SN	Sensing (S)	A preference for perceiving through the process of sensing; a preference for immediate experience, observable, concrete facts, and happenings perceived through one or more of the five senses.
		Intuition (N)	A preference for perceiving or becoming aware through the process of intuition; a preference for perceiving meanings, relationships, possibilities.
Preferred mode of judgment	TF	Thinking (T)	A preference for making judgments through impersonal, objective analysis on the basis of logical consequences and cause and effect.
		Feeling (F)	A preference for making judgments on the basis of personal or social values and subjective criteria; weighing values and the importance of choices for oneself and for others.
Preferred manner of "lifestyle"	JP	Judgment (J)	A preference for living in a planned and orderly way; a preference for a structured, predictable lifestyle and for regulating and controlling events.
		Perception (P)	A preference for living in a flexible, spontaneous way, preferring to understand and adapt to events.

Note: Adapted from information in Myers and McCaulley (1985).

personal preferences (Lawrence, 1984). Two of the four MBTI scales interact to form a useful four-fold typology of learning style (Lawrence, 1982), specifically the Introversion(I)-Extraversion(E) and the Sensing(S)-Intuition(N) scales. These two scales, when juxtaposed, create the learning style typology presented in Table 2.

Both the theory and the existing research with the MBTI suggest that it can be one effective framework for making sense of the unique processes students prefer to use in dealing with their college experience. First, the MBTI provides important information about a student's natural interests, commitments and values, work habits and, especially, learning styles. In one single profile, we have very useful data regarding some personality processes and preferences affecting a student's academic and social integration with specific campus climates. The MBTI offers to institutional researchers a tool for identifying some important psychological factors that may, in turn, affect the enrollment choices of students.

Secondly, the MBTI provides researchers a mechanism for describing the prevailing climates of certain social and academic environments on campus. A number of theorists (Walsh, 1973) suggest that it is the prevailing or dominant characteristics of student groups that determine the essential nature of campus environments. By describing a specific population of students using MBTI dimensions, one can assess the degrees of congruence various types of students may experience within a prevailing academic and social climate of a campus. In addition, the MBTI profile of the faculty in a given department may describe, in part, the academic climate faced by students in that department and the degree of integration or fit different types of learners may experience in that department. In short, the MBTI offers one framework for understanding *both* sides of Tinto's interaction equation; it can describe both the individual student and the dimensions of the environment encountered by that student. This person-environment interaction is a particularly important part of enrollment management research (Hossler, 1984).

The TRAILS Project: An Overview

The TRAILS Project (Tracking Retention and Academic Integration by Learning Style) is an enrollment research effort at Saint Louis University which positions educators to use the MBTI both in institutional studies and in a wide variety of campus programs (Kalsbeek, 1987). Most undergraduate students complete the MBTI either as part of the housing application process or the freshman orientation program. Students consent to having their MBTI scores merged for research purposes with other student data such as ACT/SAT scores, demographic data, and various self-report survey data sources (e.g., the CIRP and Pace's CSEQ). In each subsequent academic term, data on students' declared majors, GPAs, and enrollment status are entered in the data base. By maintaining such information in a cumulative data base, institutional researchers can readily answer questions such as, What types of learners tend to gravitate to certain majors? How are MBTI preferences related to aptitude measures? How well do

BEST COPY AVAILABLE

Table 2

Four Learning Styles Identified by the Myers-Briggs Type Indicator (MBTI)

IN A preference for becoming aware through intuition (N) with an introverted focus (I). This type of learner tends to be introspective and scholarly, interested primarily in ideas, theories, and depth of understanding. This tends to be the least practical of learning styles. Knowledge is considered important for its own sake. Referred to as an "abstract/reflective" style.

EN A preference for becoming aware through intuition (N) with an extraverted focus (E). This type of learner tends to see possibilities as challenges to make things happen; has wide-ranging interests; and likes to explore new patterns and relationships. Knowledge is considered important for innovation. Referred to as an "abstract/active" style.

IS A preference for becoming aware through the senses (S) with an introverted (I) focus. This type of learner tends to carefully test ideas to see whether they are supported by facts; prefers to deal with what is real and factual in a careful, unhurried way. Knowledge is considered important to establish truth. Referred to as a "concrete/ reflective" style or as "careful compilers."

ES A preference for becoming aware through the senses (S) with an extraverted (E) focus. This type of learner tends to be active and realistic and learns best when useful applications are obvious. This tends to be the most practical, pragmatic learning style. Knowledge is considered important for its pragmatic value. Referred to as a "concrete/ active" style.

Note: Adapted from information in McCaulley and Natter (1980).

different types of learners do in certain schools or majors? Do some types of learners do better early in their academic work than in subsequent studies? How is student learning style related to dropout?

The following discussion briefly addresses four specific retention research issues and presents some preliminary TRAILS data pertaining to the following:

1. Using the MBTI to describe discrete academic populations
2. The relationship of the MBTI and measures of academic aptitude
3. The relationship of the MBTI and academic achievement
4. Using the MBTI to understand persistence patterns.

Describing Student Populations

There is an extensive body of research with the MBTI which describes specific populations, especially in academic settings (McCaulley, 1978; Myers, 1980; Myers & McCaulley, 1985). The theory and research suggest that different types of students are disproportionately represented in certain academic disciplines because the demands and rewards of specific academic and career pursuits attract students with certain pesonality preferences. When a specific academic major at an institution is considered a unique academic and social environment, then the MBTI profile of the students (as well as the faculty) is important environmental information for anyone attempting to understand the degree of fit between types of students and that particular environment.

Table 3 presents some TRAILS data from Saint Louis University which illustrate the predominant learning style characteristics of several individual colleges at the University. Though all MBTI types are represented in each college, certain types are disproportionately represented in certain academic environments. For example, the IN learning style (introversion-intuition, the most abstract and reflective learning style) describes a greater proportion of learners in Arts and Sciences than in the other schools and the U.S. population at large. The ES learner (extroversion-sensing, the most active, concrete, and pragmatic style) is most common in the Nursing student population, yet least common for the Nursing faculty. TRAILS provides a complete library of such MBTI profiles for specific majors, profiles which are useful in assessing the learning climate of campus academic environments and in identifying issues of student academic integration.

Table 3

Percentage Distributions of the Four Learning Styles

	% IN	% EN	% IS	% ES
TRAILS DATA at SAINT LOUIS UNIVERSITY				
Arts & Science Undergraduates	21	31	21	27
Business Undergraduates	12	30	27	31
Nursing Undergraduates	9	33	19	40
Nursing Undergraduate Faculty	55	27	9	9
Complete TRAILS Data base	18	31	22	30
High-Risk Student Group	8	15	30	46
AMERICAN POPULATION ESTIMATES	10	20	20	50

Note: American Population Estimate from Lawrence (1982).

The conceptual foundation of the MBTI suggests that the influence of personality type is so pervasive that any one of numerous approaches to describing student populations on a campus perhaps could be enlightened by incorporating MBTI data. For example, the CIRP Freshman Survey is frequently used as a barometer of changing student characteristics—both on individual campuses and nationally. Studies at Saint Louis University show significant, predictable, and provocative

Table 4

One-Way Analysis of Variance (ANOVA) of Aptitude Score (SAT) by Learning Style

Group	N	Mean SAT	St. Dev.
IN	148	1110	184.7
EN	312	1052	177.1
IS	188	1008	224.1
ES	250	932	196.1
TOTAL	989	1019	203.6

Notes: F (3,894) = 30.5
p < .001

Scheffe Post Hoc Comparisons

	IN	EN	IS	ES
IN				
EN	*			
IS	*	*		
ES	*	*	*	

Note: * denotes p < .05

differences between "types of learners," as described by the MBTI, and responses on the CIRP survey (Kalsbeek & DeFiore, 1985). The MBTI can enhance the usefulness of the CIRP in describing student populations, especially their values, objectives, and reasons for going to college.

Academic Aptitude Measures

It is generally acknowledged that there is some relationship between MBTI preferences and performance on standardized aptitude measures (Myers & McCaulley, 1985). Myers (1980) and McCaulley and Natter (1980) discuss several reasons why intuitive learners may perform better than sensing learners on certain IQ and aptitude measures and cite some studies which illustrate these differences. The argument is often made that gifts of sensing learners cannot be measured by paper and pencil instruments and that sensing students (especially extraverted sensing learners) are at a disadvantage on any timed examination which focuses on the ability to quickly manipulate symbols, see patterns and relationships between words and concepts, and so on. The TRAILS data clearly support these patterns; on both the ACT and the SAT composites, the IN (introversion-intuition) types scored the highest, followed by the EN (extraversion-intuition), IS (introversion-sensing) and ES (extraversion-sensing) learnings styles (Table 4). These findings are wholly congruent with similar studies elsewhere (Myers & McCaulley, 1985).

The TRAILS data base includes continuous scores on each of the four MBTI indices which show the strength of the individual's preference on each scale. This offers another analytic approach to institutional studies with the MBTI, namely the investigation of the linear relationship between variables (e.g., to see if the strength of preference for intuition is related to aptitude measures). Table 5 summarizes the results of a stepwise multiple regression wherein the strengths of preference on each MBTI scale are the independent variables and the composite aptitude score is the dependent variable. The sensing-intuition scale emerges as the one significant predictor; the stronger the preference for intuition, the higher the aptitude test score.

Table 5

Four Myers-Briggs Indices and Academic Aptitude (SAT) Results of a Stepwise Multiple Regression

Variable	B	R SQ	F
Sensing-Intuition	.30	.08	22.96*
Extraversion-Introversion	.10	.09	2.86
Thinking-Feeling	-.06	.09	.95
Judgment-Perception	.02	.09	.07

Note. * denotes P < .05

If there is a relationship between student learning style, as assessed by the MBTI, and performance on traditional academic aptitude measures, students with certain learning preferences may be more likely to be found in "remedial" or "special support" programs prescribed for students with low aptitude scores. Table 3 shows the learning style profile for one such program (the "high-risk" group) and shows that extraverted-sensing (ES) learners are over 1-1/2 times more likely to be found in this group than one would expect from the overall type distribution of the student body at large. Such TRAILS profiles provide an important foundation for the academic support strategies used in these programs.

Academic Achievement

Academic achievement has a prominent role in any investigation of retention patterns. At some institutions, the inability of students to perform academically may be the single most important factor contributing to attrition. In the Tinto model, academic performance is one measure of academic integration and is an important consideration as students reassess their commitments, both to the institution and to their educational objectives (Tinto, 1975). It is important to investigate the relationship of learning style to academic achievement in order to fully integrate the MBTI with the retention model.

Table 6

Four Myers-Briggs Indices and First-Term GPA Academic Achievement

I. Results of a Stepwise Multiple Regression—without aptitude (SAT)

Variable	B	RSQ	F
Extraversion-Introversion	.24	.05	16.71**
Judgment-Perception	-.13	.06	4.47*
Sensing-Intuition	.13	.08	4.15*
Thinking-Feeling	.10	.08	3.00

II. Results of a Stepwise Multiple Regression—with aptitude (SAT)

Variable	B	RSQ	F
Aptitude Score (SAT)	.43	.18	67.35**
Extraversion-Introversion	.20	.22	13.85**
Judgment-Perception	-.14	23	6.68**
Thinking-Feeling	.13	.24	5.73*
Sensing-Intuition	.00	.24	.00

Note. * denotes $P < .05$
** denotes $P < .01$

There is a relationship between strength of preference on three of the four MBTI indices and academic achievement (GPA) in the first semester at Saint Louis University. Table 6 shows that the greater the preference for intuition and the greater the preference for introversion, the better the first-term GPA. Also, there is a relationship between the judging/perceiving preference and academic performance; the greater the preference for judging, the better the GPA.

Table 6 also reports the relationship of each MBTI scale with first-term GPA when aptitude is also entered in the stepwise regression equation. The SAT composite score emerges as the best predictor, and the sensing-intuition scale (which is the only scale significantly related to aptitude; see Table 4) does not enter the equation as a significant factor. Above and beyond the aptitude measure, however, three MBTI scale are significantly related to academic performance: Preferences for introversion, judging, and feeling all contribute significantly to academic performance in the first term, even when aptitude tests scores are considered.

In retention research, subsequent academic performance is as important as first-term GPA in determining factors that contribute to students' successful persistence through a complete program of study at the institution. Table 7 presents preliminary TRAILS data on the effect of learning style on academic achievement in the upper-division curriculum for students in four specific colleges at Saint Louis University. Using the fall semester GPA for juniors and seniors as the dependent variable and the four learning style groups as independent variables, one-way ANOVAs (analyses of variance) for each school show no significant differences by learning style.

These data suggest that personality factors that are related to performance on aptitude tests and in the first year's core curriculum at the University may not be related to performance in the discipline-specific upper-class curriculum. Perhaps students of varying learning styles develop as learners while in college so that some basic inclinations and preferences are offset by a broader repertoire of learning skills. Perhaps the nature of aptitude testing and the freshman curriculum simply disadvantage certain learners who are no more or less likely to do well in their advanced studies. Ongoing research further explores these notions; the implications for our practice as educators and as institutions are provocative.

Attrition

The Tinto model suggests that dropout is the outcome of insufficient integration of the student with the social and academic environments of an institution. The theory underlying the MBTI suggests that students with different preferences will find different kinds of environments rewarding, supporting, challenging, and so on—all of which affect choices about persistence. Comparing persisting to non-persisting populations while also considering the aptitude and achievement findings discussed above is the final objective of the TRAILS approach to retention research. The sample size for non-persisters, to date, is far too limited, yet preliminary analysis suggests that in some academic programs, MBTI scales which have little effect on academic aptitude, first-term GPA, or upper-class GPA may nevertheless be related to persistence, perhaps through dynamics of social integration, as noted by Pascarella (1986). Further research is under way to directly investigate these relationships to dropout.

It appears, nevertheless, that regardless of these academic aptitude, achievement, and attrition measures, the MBTI is related to measures of the social and academic integration so critical to the Tinto model. Studies at Saint Louis University demonstrate significant and predictable differences between types of students (as defined by MBTI profiles) and the quantity and quality of faculty interaction, student acquaintanceship patterns, use of the library, use of the student union and athletic facilities, and various other indices of student integration with the academic and social environment (Kalsbeek & DeFiore, 1988). By linking the MBTI with measures such as the CSEQ (Pace, 1987), relationships between learning style or personality type and the actual student experience on campus can be considered in the overall equation of student-environment integration.

Discussion

This brief overview of some components of the TRAILS research endeavor suggests that, for at least one institution, certain personality characteristics affect student performance on aptitude tests, student interest in academic majors or careers, first-term academic performance, and student-campus integration. The project attempts to meld all of these pieces in a comprehensive enrollment research scheme. The preliminary data generate a number of disturbing and provocative questions for educators.

Table 7

Results of Four One-Way Analyses of Variance (ANOVAS) for Each College: Mean Upper-Class Grade Point Average by Learning Style

	Arts & Sciences		Business		Nursing		Allied Health	
Learning Style	n	mean	n	mean	n	mean	n	mean
IN	64	3.32	15	2.91	5	3.20	17	3.31
EN	82	3.26	42	2.93	23	3.37	30	3.64
IS	68	3.17	35	3.15	12	3.51	12	3.51
ES	75	3.22	42	3.04	25	3.26	37	3.48
Total	289	3.24	134	3.02	65	3.34	96	3.50
F ratio		.53		1.03		.61		1.29
F prob.		.66		.38		.61		28

First, though certain types of learners score significantly lower than others on the ACT and the SAT, there appear to be no differences between types of learners in upper-class academic achievement in the heart of their chosen curriculum. For example, there is evidence that sensing learners may be the most successful students in certain academic pursuits (McCaulley, 1978; Kalsbeek, 1984) in spite of the fact that the sensing preference may lead to poorer scores on timed aptitude tests like the ACT, SAT, MCAT or GRE. Using such aptitude measures to screen students for admission may be a disservice to some students and also, perhaps, to the vitality and success of specific academic programs.

Second, if certain types of learners tend to score lower on aptitude tests than other learners, the trend of declining board scores takes on new meaning. Available data suggest that an ever-increasing number of "sensing" students are entering American colleges and universities and that, in contrast to 10-20 years ago, the majority of college students today have a preference for a sensing learning style (Myers, 1980; Davis & Schroeder, 1983). Academic programs which have witnessed a decline in ACT or SAT scores might benefit from using the MBTI to investigate shifts in the prevailing learning style of their students.

In a different perspective, the current trend in public policy to monitor the quality of undergraduate programs through comprehensive assessment of student-learning outcomes tends to focus on the use of standardized assessment measures. Research, such as that pursued at Saint Louis University as part of the TRAILS project, suggests that poor performance on some standardized and timed measures may work to the disadvantage of certain types of learners in ways which do not disadvantage them in their actual academic pursuits. Data on the relationship of learning style to aptitude test performance have powerful implications for such policies at the institutional, state, and federal levels.

Using Learning Style Research

The TRAILS model provides information and insights that can be readily translated into institutional retention interventions. Educators have available an extensive body of literature (Provost & Anchors, 1987) about appropriate educational interventions for different learners found to be "at risk" in specific academic and social environments on campus. The MBTI has been used successfully in career planning and academic advising (Pinkney, 1983; Myers & McCaulley, 1985), personal counseling (Provost, 1984), in residence halls (Schroeder & Jackson, 1987), and in instructional development programs (Jensen & DiTiberio, 1984). Educators familiar with the MBTI can make effective use of such data in a wide range of retention interventions, from freshman orientation to advising to faculty development (Beal & Noel, 1980). The numerous successful applications of the MBTI in both academic and student affairs stem largely from its inherent face validity and its nonjudgmental approach to describing individual differences.

At Saint Louis University, for example, TRAILS data have been used in faculty-development workshops focusing on the relationship of learning styles and teaching styles, especially in the context of developing writing skills (Shroeder, DiTiberio & Kalsbeek, 1988). TRAILS data are used in career and academic counseling with undecided students in order to explore interests and skills, with academically at-risk students to develop academic skills, with nursing and physical therapy faculty to consider curriculum revisions and new teaching methods, in residence halls to understand dynamics of community development, and with new students in the freshman orientation to sensitize them to natural differences between types of learning.

Conclusion

The MBTI is one mechanism for ensuring that institutional research contributes useful knowledge for educators. The necessary first step is to incorporate such personality measures in the institution's enrollment research endeavor so that appropriate areas for intervention can be targeted and actual intervention efforts can be evaluated. The TRAILS approach to retention research fits well with the premises of the Tinto model and enrollment management research in general (Hossler, 1984) by enabling researchers to investigate the person-environment fit that is critical to understanding the persistence patterns of students. Incorporating personality indices such as the Myers-Briggs Type Indicator in the research scheme allows

institutional researchers to assess not only proxy measures of social and academic integration but the fundamental cognitive and affective processes that influence such integration—dynamics which are likely to vary by institution (Pascarella, 1986). The TRAILS project is one model for designing retention studies which incorporate useful information for improving the quality of the social and academic experiences of different types of students—and thereby improving campus retention.

References

Beal, P. & Noel, L. (1980). *What Works in student retention*. Iowa City, IA: The American College Testing Program/The National Center for Higher Education Management Systems.

Bean, J.P. (1982). Conceptual models of student attrition: How they can help the institutional researcher. In E. Pascarella (Issue Ed.), Studying student attrition. *New Directions for Institutional Research, 9*(4, Serial No. 36, pp. 17-33). San Francisco: Jossey-Bass.

Davis, M. & Schroeder, C. (1983). New students in liberal arts colleges: Threat or challenge? In J. Watson & R. Stevens (Eds.), *Pioneers and pallbearers: Perspectives on liberal education*. Macon, GA: Mercer University Press.

Hossler, D. (1984). *Enrollment management: An integrated approach*. New York: The College Board.

Jensen, G. & DiTiberio, J.K. (1984). Personality and individual writing processes. *College Composition and Communication, 35*, 285-300.

Jung, C.G. (1923). *Psychological types*. London: Rutledge & Kegan Paul.

Kalsbeek, D.H. (1984). *The School of Nursing and the Myers-Briggs Type Indicator: A descriptive summary of TRAILS findings and national data on the use of the MBTI with nursing populations* (Saint Louis University: Student Life Studies Research Report).

Kalsbeek, D.H. (1987). Campus retention: The MBTI in institutional self-studies. In J.A. Provost & S. Anchors (Eds.), *Applications of the Myers-Briggs Type Indicator in higher education*. Palo Alto, CA: Consulting Psychologists Press.

Kalsbeek, D.H. & DeFiore, R.M. (1985). *Type differences and the CIRP American Freshman Survey* (Saint Louis University: Student Life Studies Research Report).

Kalsbeek, D.H. & DeFiore, R.M. (1988). *Personality type and the student experience at Saint Louis University: Relationships between the MBTI and the College Student Experiences Questionnaire* (Saint Louis University: Student Life Studies Research Report).

Lawrence, G. (1982). *People types and tiger stripes: A practical guide to learning styles*. Gainesville, FL: Center for Application of Psychological Type.

Lawrence, G. (1984). A synthesis of learning style research involving the Myers-Briggs Type Indicator. *The Journal of Psychological Type*, Vol. 8.

McCaulley, M. (1978). *Application of the MBTI to medicine and other health professions*. Gainesville, FL: Center for Application of Psychological Type.

McCaulley, M. & Natter, F.L. (1980). Psychological (Myers-Briggs) type differences in education. In F.L. Natter & S.A. Rollings (Eds.), *The Governor's Task Force on Disruptive Youth, Phase II Report*. Gainesville, FL: Center for Application of Psychological Type.

Myers, I. (with Myers, P., 1980). *Gifts differing*. Palo Alto, CA: Consulting Psychologists Press.

Myers, I. & McCaulley, M. (1985). *Manual: A guide to the development and use of the Myers-Briggs Type Indicator*. Palo Alto, CA: Consulting Psychologists Press.

Pace, C.R. (1987). *College Student Experiences Questionnaire: Test manual and norms*. Los Angeles: University of California, Los Angeles, Graduate School of Education.

Pascarella, E. (1986). A program for research and policy development on student persistence at the institutional level. *Journal of College Student Personnel, 27*(2).

Pinkney, J.W. (1983, November). The Myers-Briggs Type Indicator as an alternative in career counseling. *Personnel and Guidance Journal*.

Provost J. (1984). *A casebook: Applications of the Myers-Briggs Type Indicator in couseling*. Gainesville, FL: Center for Application of Psychological Type.

Provost, J.A. & Anchors, S. (Eds., 1987). *Applications of the Myers-Briggs Type Indicator in higher education*. Palo Alto, CA: Consulting Psychologists Press.

Schroeder, C.C., DiTiberio, J.T. & Kalsbeek, D.H. (1988). Bridging the gap between faculty and students: Opportunities and obligations for student affairs. *NASPA Journal, 26*(1).

Schroeder, C.C. & Jackson, G.S. (1987). Designing residential environments. In J.A. Provost & S. Anchors (Eds.), *Applications of the Myers-Briggs Type Indicator in higher education*. Palo Alto, CA: Consulting Psychologists Press.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 43*(1), 89-125.

Walsh, W.B. (1973). *Theories of person-environment interaction: Implications for the college student*. Iowa City, IA: The American College Testing Program.

For information about back issues of the AIR Professional File:

The Association for Institutional Research
314 Stone Building, Florida State University
Tallahassee, Florida 32306-3038 (904) 644-4470